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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,531	10/16/2003	Kazuaki Tsukakoshi	500.43214X00	5983
24956 7590 05/15/2007 MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C. 1800 DIAGONAL ROAD SUITE 370 ALEXANDRIA, VA 22314			EXAMINER PATEL, JAY P	
			ART UNIT 2616	PAPER NUMBER
			MAIL DATE 05/15/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/685,531

Applicant(s)

TSUKAKOSHI, KAZUAKI

Examiner

Jay P. Patel

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-14 are pending.
2. Claims 1-14 are rejected.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The independent claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, independent claims 1 and 11-14 recites "adding transmission condition information" (in claim 1, lines 14-15); however, the specification fails to describe how the "transmission condition information" is obtained. For example, figure 1 shows a transmission-condition identifying information signal 112 obtained from block 111 but the specification fails to describe how block 111 generates signal 112 based on signal 110. Furthermore, the specification also fails to describe how signal 110 is generated by block 109 based on signal 108.

Art Unit: 2616

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claims 1 and 11-14, they contain the phrase "multi-level modulation." Does the applicant mean a hierarchy of modulation techniques in sequence or does the phrase refer to something different?

In regards to claims 12 and 14, they contain the phrase "multi-level demodulation." Does the applicant mean a hierarchy of demodulation techniques in sequence or does the phrase refer to something different?

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1, 4-9, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghosh et al. (US Patent 6366601 B1) in view of Bender et al. (US Patent 6888805 B2), Budka et al. (US Patent 6330288 B1), and Tanaka et al. (US Patent 5781542).

In regards to claims 1 and 13, Ghosh discloses in figure 1, a transmission apparatus 100 inclusive of an encoder/modulator 107 that modulates a plurality of inputs via variable modulator 153 (a primary modulator to modulate multiple sub-channels). CDMA modulator 115, further modulates the plurality of sub-channels at a second stage (a secondary modulator for band broadening).

In further regards, after spreading by spreading codes 108, the outputs of the encoder/modulator 107 are summed by summer 112 (a frequency division multiplexer for multiplexing the plural sub-channels and outputting a frequency multiplexed channel).

In further regards to claims 1 and 13, Ghosh fails to teach, adding transmission condition information to each transmission sub channel to select modulation techniques. Bender teaches the above-mentioned limitation. Bender shows in figure 10, a forward channel transmission apparatus inclusive of a modulator 1020, which chooses modulation formats based on the data rate (adding the transmission condition information in order to select the modulation techniques)(see column 12, lines 34-40).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide the data rate to a modulator as taught by Bender into a modulator that modulates a plurality of sub-channels as taught by Ghosh. The motivation to do so would be select a sequence of complex data modulation symbols for each packet (see column 12 in Bender, lines 44-45).

In further regards to claims 1 and 13, Ghosh also fails to teach, determining a number of transmission sub-channels based on transmission-condition information.

Art Unit: 2616

Budka teaches the above-mentioned limitation. Budka discloses in figure 3, a method to select an optimum modulation scheme. At step 220, a determination is made as to how many blocks (sub-channels) are required to transmit the data based on the carrier-to-interference ratio.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the process to select the number of sub-channels as taught by Budka with the transmission and modulation methods taught by Ghosh and Bender. The motivation to do so would be to select only the required number of blocks in order to avoid wasting bandwidth.

In further regards to claims 1 and 13, although Ghosh teaches in figure 1, an encoder/modulator apparatus 107 taking inputs from multiple users 101-1 through 101-k, Ghosh fails to teach the inputs coming from the same user after going through a data dividing circuit. Tanaka however, teaches dividing transmission information into a number of sub-channels by using an information dividing section in a transmitter (see section 10 in figure 2).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to include a data dividing section as taught by Tanaka into the apparatus and methods taught by Ghosh, Bender and Budka to change the source of information inputted in the modulator from packets originating from multiple users to packets originating from a single user. The motivation to do so would be allow a single user to use a modulation technique where multiple packets from a same user are modulated simultaneously.

In regards to claim 4, Ghosh teaches a variable modulator 153 that allows the choosing of one of 64/16/4 QAM for each user 101 and the carrier modulator 115 modulates using CDMA.

In regards to claim 5, Ghosh teaches in figure 1, an encoder/modulator that provides encoding and modulations for several users 101 (group of transmission sub-channels). Furthermore, Ghosh teaches a variable modulator 153 that allows the choosing of one of 64/16/4 QAM for each user 101 and the carrier modulator 115 modulates using CDMA.

In regards to claim 6, Ghosh teaches that the inputs come from a number of users 101-1 through 101-k.

In regards to claim 7, Ghosh teaches that any of the modulators 107-1 - 107-k may include a turbo encoder 150 which precedes the variable modulator 153.

In regards to claims 8 and 9, Ghosh teaches that the modulation-coding schemes 111 are selected at the modulators 107 and coding rates 110.

7. In regards to claim 11, In regards to claim 1, Ghosh discloses in figure 1, a transmission apparatus 100 inclusive of an encoder/modulator 107 that modulates a plurality of inputs via variable modulator 153 (a primary modulator to modulate multiple sub-channels). CDMA modulator 115, further modulates the plurality of sub-channels at a second stage (a secondary modulator for band broadening).

In further regards, after spreading by spreading codes 108, the outputs of the encoder/modulator 107 are summed by summer 112 (a frequency division multiplexer

Art Unit: 2616

for multiplexing the plural sub-channels and outputting a frequency multiplexed channel).

In further regards to claim 11, Ghosh fails to teach, adding transmission condition information to each transmission sub channel to select modulation techniques. Bender teaches the above-mentioned limitation. Bender shows in figure 10, a forward channel transmission apparatus inclusive of a modulator 1020, which chooses modulation formats based on the data rate (adding the transmission condition information in order to select the modulation techniques)(see column 12, lines 34-40).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide the data rate to a modulator as taught by Bender into a modulator that modulates a plurality of sub-channels as taught by Ghosh. The motivation to do so would be select a sequence of complex data modulation symbols for each packet (see column 12 in Bender, lines 44-45).

In further regards to claim 11, Ghosh also fails to teach, a controller for generating a controlling signal based on transmission-condition information or determining a number of transmission sub-channels based on transmission-condition information. Budka teaches the above-mentioned limitations. Budka discloses in figure 2, a controller 110 that selects an optimum coding/modulation scheme for the transmitter 120 based on based on the carrier to interference ratio received (see figure 2 and column 3, lines 8-15). Budka discloses in figure 3, a method to select an optimum modulation scheme. At step 220, a determination is made as to how many

blocks (sub-channels) are required to transmit the data based on the carrier-to-interference ratio.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the process to select the number of sub-channels as taught by Budka with the transmission and modulation methods taught by Ghosh and Bender. The motivation to do so would be to select only the required number of blocks in order to avoid wasting bandwidth.

In further regards to claim 11, although Ghosh teaches in figure 1, an encoder/modulator apparatus 107 taking inputs from multiple users 101-1 through 101-k, Ghosh fails to teach the inputs coming from the same user after going through a data dividing circuit. Tanaka however, teaches dividing transmission information into a number of sub-channels by using an information dividing section in a transmitter (see section 10 in figure 2).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to include a data dividing section as taught by Tanaka into the apparatus and methods taught by Ghosh, Bender and Budka to change the source of information inputted in the modulator from packets originating from multiple users to packets originating from a single user. The motivation to do so would be allow a single user to use a modulation technique where multiple packets from a same user are modulated simultaneously.

8. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghosh et al. (US Patent 6366601 B1), Bender et al. (US Patent 6888805 B2), Budka et

al. (US Patent 6330288 B1), and Tanaka et al. (US Patent 5781542) as applied to claim 1 above and further in view of Webster et al. (US Publication 2004/0056785 A1) and Pathak et al. (US Patent 7016317 B1).

In regards to claims 2 and 3, Ghosh in combination with Bender, Budka and Tanaka, teach all the limitations of parent claim 1. Neither of the above-mentioned references teach, selecting a primary modulation scheme from one of BPSK, QPSK and 16QAM. Webster teaches the above-mentioned limitation. Webster teaches a transceiver 101 where data is incorporated using a modulation scheme from one of BPSK, QPSK, 16QAM and 64QAM (see page 3, paragraph 24).

Therefore it would have been obvious to one skilled in the art at the time the invention was made to incorporate the choosing of one of multiple modulation techniques as taught by Webster into the variable modulator as taught by Ghosh. The motivation to do so would be to employ a diverse array of constellations using anywhere from 2-64 constellation points depending on the modulation technique chosen.

In further regards to claims 2 and 3, although Ghosh modulates the signal summed by summer 113 using a CDMA modulator, neither Ghosh nor any of the above-mentioned references teach choosing between two band-broadening schemes, either OFDM or spectrum spreading. Pathak teaches the above-mentioned limitation. Pathak teaches that modems in subscriber stations 32 implement a suitable multiple access technique (inclusive of CDMA (spectrum spreading) and OFDM) to communicate with base stations 24 (see figure 1 and column 6, lines 8-12).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made, to modify the modulation apparatus and techniques as taught by Ghosh Bender, Budka, Tanaka and Webster to also allow the use of OFDM as taught by Pathak. The motivation to do so would be provide diversity when choosing a spread spectrum modulation technique.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ghosh et al. (US Patent 6366601 B1) Bender et al. (US Patent 6888805 B2), Budka et al. (US Patent 6330288 B1), Tanaka et al. (US Patent 5781542), further in view of Martini et al. (US Patent 7039837 B1).

In regards to claim 10, Ghosh in combination with Bender, Budka and Tanaka, teach all the limitations of parent claims 1, 7 and 9. Neither of the above-mentioned references specifically including convolutional coding, Reed-Solomon and BCH. Martini teaches the above-mentioned limitation. Martini teaches that forward error corrections schemes such as BCH, convolutional coding and Reed-Solomon coding are used conventionally in wireless communications (See column 1, lines 12-15).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to specifically include the above-mentioned coding schemes as taught by Martini in the modulation/coding scheme list provided by Ghosh. The motivation to do so would be to provide a level of protection for compressed bit streams (see column 1, lines 18-21).

10. Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hata (US Publication 2002/0136190 A1), Budka et al. (US Patent 6330288 B1), and Shirakata et al. (US Patent 6618352 B1).

In regards to claims 12 and 14, Hata discloses in figure 5, an OFDM receiver. The receiver is inclusive of an in phase distributor H (a frequency separating circuit for de-multiplexing a frequency multiplexed signal).

The receiver in figure 5 is also inclusive of multiple OFDM demodulation sections 106, whose outputs are supplied to a parallel to serial converter 210 (a data combining circuit for combining data acquired from plural sub-channels).

In further regards to claims 12 and 14, Hata fails to teach a transmission identifying circuit to identify a transmission condition inclusive of primary and secondary modulation techniques and a control circuit for generating a control signal based on the transmission condition. Budka teaches the above-mentioned limitations.

Budka shows in figure 2 a wireless transmission/reception apparatus. The receiver 106, provides a measure of carrier to interference ratio via signal 106 (a transmission condition identifying circuit) to controller 110, which identifies modulation/coding schemes based on the received carrier-to-interference ratio (transmission condition information containing modulation and coding techniques and identifying a control signal based on the transmission condition) (column 2, lines 62-67 and column 3, lines 1-13).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to include the receiver functionality of measuring a C/I ratio and

the controller functionality to identify coding/modulation schemes based on the C/I ratio into the OFDM receiver taught by Hata. The proper motivation to do so would be to use the strongest coding/modulation schemes available at the transmission side to achieve a maximum throughput.

In further regards to claims 12 and 14, although Hata teaches OFDM demodulation section 106, neither Hata nor Budka teach the OFDM demodulation section having a band-debroadening and a variable demodulation sections respectively. Shirakata however teaches the above-mentioned limitations. In figure 1, shows a block diagram of an OFDM demodulator. The demodulator is inclusive of a quadrature detector 3, which downconverts an OFDM into a baseband section (a secondary demodulator for band-debroadening). The demodulator also includes a data demodulator 13 (secondary multi-variable demodulator) to reproduce transmitted data.

Therefore it would have been obvious to one skilled in the art at the time the invention was made to incorporate the secondary and primary demodulation functionality of the OFDM modulator taught by Shirakata in the OFDM receiver taught by Hata and with the controller taught by Budka. The proper motivation to do so would be to allow proper detection of the transmitted signal and to allow proper reproduction of the transmitted data by allowing proper demodulation on tow concurrent stages.

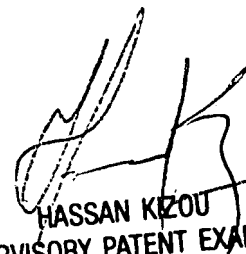
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jay P. Patel whose telephone number is (571) 272-3086. The examiner can normally be reached on M-F 9:00 am - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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